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Business Investment Programs and Their Realization

THE Office of Business Economics and the Securities and Exchange Commission have, since World War II, been compiling data on anticipated as well as actual capital outlays by business. Early each quarter a sample of firms is asked to report plant and equipment expenditures for the quarter just past and budgeted or planned expenditures for each of the current and succeeding quarters. Annually, at the year-end, these firms are also asked to report both their anticipated capital outlays and sales for the following year.[1]

This article will use these data to analyze the differences between the plant and equipment expenditures programed or planned by business and those actually realized, in order to appraise the accuracy with which businessmen anticipate their capital outlays, as well as more generally to cast light on the nature of investment decisions. Attention will be paid not only to the aggregate discrepancies between actual and anticipated expenditures but also to the individual company differences. These differences will be analyzed in terms of the type of company involved, the size and form of investment, and the cyclical and other characteristics of the period covered.

For the last full year covered in this analysis—1949—a special questionnaire was sent to a sample of companies asking them to indicate the reasons for differences between actual and anticipated expenditures. The results of this survey provide, for the first time, fairly comprehensive direct information on the factors which motivate businessmen's changes in investment decisions.

Summary

It appears from the available evidence that aggregate expenditures for plant and equipment can be estimated 1 year ahead with reasonable accuracy on the basis of the amounts which businessmen anticipate spending. When investment is measured in physical volume terms, the accuracy of projections based on anticipations is further improved.

The most important reason for these results are, first, that investment decisions as reflected in business programs involve commitments some time in advance and, second, that many of the factors which affect these decisions for individual firms tend to offset in the aggregate. The projection of expenditures on the basis of anticipated outlays gives better results on the average than alternative procedures.

Apart from influences which offset in their effect on investment programs of different firms, there are cyclical factors which tend to make actual expenditures somewhat higher or lower than those anticipated, depending on the direction of movement in economic conditions. In addition, there is some tendency toward systematic understatement in the expenditure plans reported by business, largely as a result of the omission of many small items of capital outlays and the exclusion of items whose acquisition is uncertain.

By making appropriate adjustments for these factors, projections based on anticipations can be improved, but additional data for other periods will be required before the magnitude of these adjustments can be determined at different stages of the cycle. The quarterly anticipations have provided a useful adjunct to the annual data in making adjustments for sharp changes in the economic situation.

There is a wide disparity in the accuracy with which individual businessmen anticipate their capital outlays, though in the aggregate the positive and negative discrepancies tend to cancel out. The degree of accuracy is related to many different factors, including size of firm, amount of investment, and age of existing assets.

The largest firms are much more accurate in their anticipations than the smallest firms. Similarly, firms projecting large-scale investment (relative to existing assets) perform better than those planning minor expenditures. It is also interesting to note that where existing plant and equipment is relatively old, firms are less likely to substantially curtail their planned expenditures.

An analysis of the changes in investment programs and associated changes in the firm's operating experience and financial position did not disclose any statistically significant relationships in the postwar years. Changes in sales and earnings, whether these were anticipated or unanticipated, seem to have had only a slight effect in this period on the realization of annual investment programs for most firms. The same thing is true of changes in the firm's liquid position and of changes in the ratio of unfilled orders to sales, which might be taken as a measure of pressure on capacity as well as an indication of future earnings.

The absence of significant relationships between changes in investment and sales or earnings for firms as a whole is due in part to the unusual backlog of demand for capital goods during these years but also reflects the complexity of factors affecting investment decisions. Even within this period, however, there were a number of firms for which movements in sales and earnings did exercise a decisive influence on investment programs.

A special questionnaire sent to a sample of companies with large percentage differences between actual and anticipated expenditures in 1949 indicates that for these firms changes in the sales and in the earnings outlook accounted for nearly half of the cases where actual expenditures in 1949 were lower than those anticipated. These two factors were also given as reasons for increasing expenditures but in a much smaller proportion of the cases. Of the many other factors resulting in downward revisions in planned outlays, probably the single most important was a change in working capital requirements.

The most significant factors tending to increase planned expenditures were changes in the plant and equipment supply situation, changes in plant and equipment costs, competitive conditions, new products, and the failure to report small capital outlays and items whose acquisition was regarded as uncertain. These factors were mentioned as the principal motivating forces by 73 percent of the firms with

[1] The sample firms regularly responding in the survey consist of close to 1,000 registered corporations in all industries reporting each quarter to the Securities and Exchange Commission and more than 1,100 nonregistered manufacturing companies, noncorporate as well as corporate, reporting to the Office of Business Economics. On the basis of these reports totals are estimated for all nonagricultural business by major industry groups and are publicly released as a regular quarterly series.

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expenditures higher than planned but only by 28 percent of the firms with lower expenditures.

Though there were significant changes during 1949 in the availability of equity and debt financing, they were quite unimportant in altering planned outlays on plant and equipment. Technological developments were only moderately more influential.

In general it appears that a sizable proportion of the changes in planned outlays on plant and equipment is attributable to factors whose impact is determined by cyclical influences, but there are other important factors which are largely independent of the level of business activity.

Role of Investment

The series on actual and anticipated plant and equipment expenditures has in a comparatively short time become one of the most widely used economic barometers, and it may be worthwhile to consider briefly the reason for the great interest which has been evidenced in this type of information.

The long-term role of investment in adding to the Nation's stock of capital, in raising productivity, and in contributing a major share to the secular rise in the standard of living is of fundamental importance to the economy. However, possibly even more attention in recent years has been placed on the role of investment in the cyclical determination of income.

The flow of funds into fixed business investment is among the most dynamic elements of the economy. In direction and timing, these capital outlays have corresponded fairly closely with the movement of the more comprehensive measures of general economic activity such as the gross national product, but the relative magnitude of the changes in capital expenditures has typically been much more pronounced.

The sensitivity of these capital expenditures reflects their dependence on relatively volatile business expectations, their postponability, and their reliance on external financing. Because of these influences, investment by any individual or business is normally much less tied down to current income than is consumption—the other major type of expenditure. As a consequence, total investment by the economy is usually considered to be a major determinant of—as well as affected by—the level of business activity or the national income.

It is the independent influence of investment on income that is a predominating reason for the interest that attaches to the series on plant and equipment expenditures. Moreover, investment decisions involve commitments some time in advance, so that they would be expected to provide some advance insight into the course of expenditures.

Factors affecting investment programs

Investment programs are affected not only by the factors determining a firm's demand for capital goods but also by those determining the supply of such goods. The supply situation is, however, less subject to the control of the individual firm.

On the demand side, investment decisions are largely a reflection of discounted profit expectations, with due regard to the uncertainty with which these expectations are held and due allowance for the expected cost of financing. At times, of course, funds may not be available on virtually any terms. The expected rate of return on investment, which in turn reflects estimated sales and fixed and variable costs, is a function of many different variables, including the level of and the rate of change in sales, orders, utilization of capacity, prices and costs, and technological and institutional developments. It is affected by, though not completely determined by, past experience.

An investment decision in response to a given expected rate of return and cost of financing may further depend on the financial condition of the business, including its liquidity and debt-equity position. It will also be influenced by other noneconomic as well as economic characteristics of the firm and period, of which the most important are those affecting the degree of confidence or certainty which is placed on the appraisal of prospects.

When actual investment of an individual firm deviates significantly from that planned, it may reflect a divergence between actual conditions and expectations with respect to the factors mentioned above as determining demand, or it may indicate that the supply situation is different from that anticipated. For firms in the aggregate, it would be expected that many though not all of these reasons for differences between actual and anticipated expenditures would offset each other. An indication of the extent to which there is such offsetting is presented in the next section.

Aggregate Expenditures—Actual Versus Anticipated

Table 1 and chart 1 show the comparison between actual and anticipated aggregate expenditures on new plant and equipment in the years 1947–50 for which such information is available. The table gives the data by major industry groups as well as an all-industry total.

It is evident that the degree of accuracy with which businessmen have anticipated their actual outlays in the past has varied considerably both by industries and more importantly by years. In 1947—the first calendar year for which planned outlays were collected—actual expenditures were 16 percent higher than those anticipated at the beginning of the year, while in 1948 and 1949 the differences were reduced to 3 percent and 1 percent, respectively. In 1950 it again appears that actual expenditures will considerably exceed those anticipated, the difference probably amounting to more than 12 percent.

Before considering some of the possible explanations for these discrepancies, mention might be made of the comparative results obtained by other procedures. This obviously constitutes one test of the usefulness of anticipation data.

The projection of expenditures on the basis of anticipated outlays gives better results on the average than those obtained by extending current outlays. The same conclusion is reached if any other obvious extrapolation of past data is used, such as adjusting current expenditures by the rate of change in such expenditures, or estimating prospective outlays from lagged profits.

The accuracy of the projection of expenditures on the basis of anticipated outlays, however, is not very satisfactory in 1947 and 1950. In 1947, this result may be explainable in part by the newness of the survey and in part by an unanticipated easing of supplies and elimination of restrictions on nonresidential construction; in 1950, the Korean developments—which obviously could not be foreseen by businessmen at the beginning of the year—played a major though not exclusive role in the change in the investment picture.

Probably the most encouraging aspect of the comparative data cited above is the indicated ability of the anticipated expenditures to correctly project a downward movement in actual outlays at the cyclical turning point which occurred at the beginning of 1949. It is much easier to project current trends than to anticipate a real change in the business situation. Moreover, it should be pointed out that in the first quarter of 1948 businessmen correctly anticipated an increase in expenditures in spite of the weakening in prices and orders at that time.[2] In both 1948 and 1949, virtually every industry was able to indicate whether their outlays

[2] Similarly, a special survey carried out in early 1945 of capital outlays planned by businessmen in the first postwar year (SURVEY OF CURRENT BUSINESS, June 1945) pointed to a high level of such expenditures at a time when there was considerable uncertainty concerning the immediate postwar trend and the extent of decline in the volume of business activity that could be anticipated in this period.

would rise or decline during the year—the one exception being a rather small group.

Quarterly comparison

The quarterly anticipations provide a useful adjunct to the annual data, particularly when the economic situation changes rapidly. Thus in 1950 they depicted in advance the substantial upsurge in capital outlays in the second half of the year.

Since businessmen are requested quarterly to supply their estimated outlays for each of the past, current, and next quarters, there are really two series of anticipated quarterly expenditures—the first anticipations typically relating to quarterly outlays as much as 4½ months in the future, and the second anticipations relating on the average to actual expenditures of the past 1½ months and prospective outlays for the next 1½ months.

Except when sudden changes occur in the economic situation, neither set of quarterly anticipations gives appreciably more accurate approximations of aggregate expenditures than do projections for an entire year. Moreover, when tested against the other methods of projecting outlays, the quarterly anticipations do not fare much better in such a comparison than do the annual anticipations. The second set of anticipations furnishes only moderately better results than the first set.

Table 1.—Business Expenditures for New Plant and Equipment: Actual and Anticipated, 1947–50 [1]

(Millions of dollars)

Item	1947		1948		1949		1950	
	Anticipated	Actual	Anticipated	Actual	Anticipated	Actual	Anticipated	Actual[2]
All industries	13,890	16,180	18,610	19,230	18,310	18,120	16,090	18,130
Manufacturing	6,170	7,460	7,700	8,340	7,240	7,250	6,710	7,160
Mining	810	940	910	800	820	740	640	690
Railroads	1,000	910	1,530	1,320	1,450	1,360	930	1,140
Other transportation	(3)	(3)	780	780	660	620	350	430
Electric and gas utilities	1,650	1,900	2,300	2,080	3,130	3,140	2,040	3,230
Commercial and miscellaneous [4]	[4] 4,420	[4] 5,230	5,500	5,400	6,010	6,120	5,420	4,700

[1] Data exclude expenditures of agricultural business and outlays charged to current account. Anticipated expenditures were reported by business between mid-January and mid-March of the respective year.

[2] Data include actual outlays in first 3 quarters and expenditures anticipated by business for the fourth quarter.

[3] Other transportation in 1947 is included in the commercial and miscellaneous group.

[4] Data include trade, service, communications, construction and finance.

Source: U. S. Department of Commerce, Office of Business Economics and Securities and Exchange Commission.

Though these are the results for all companies combined, it is interesting to note that for most individual firms the second anticipation is significantly more accurate than the first and is appreciably better than the other procedures for projecting quarterly outlays. The comparative accuracy of the second set of anticipations is particularly marked for the large and medium size firms.

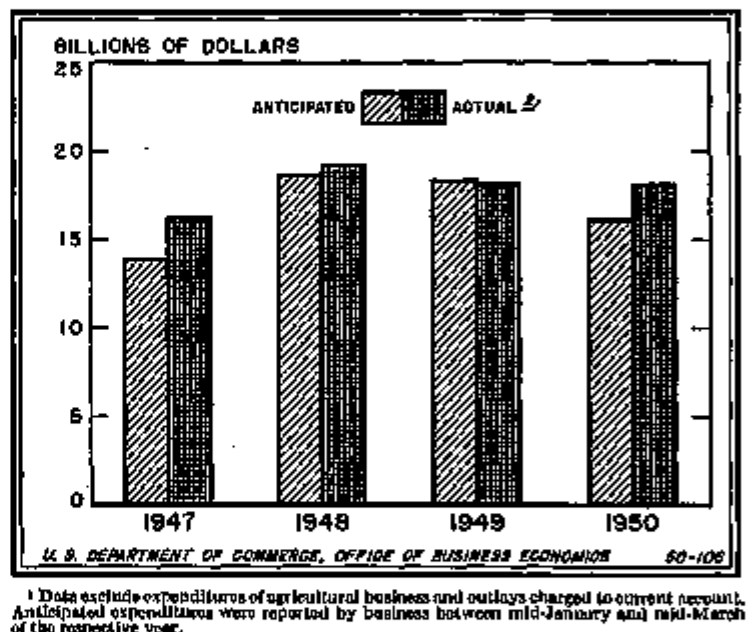
The inaccuracies involved in the quarterly anticipations—particularly the second set—are probably to a considerable extent due to the difficulties in programing the deliveries of, and consequently the outlays on, capital goods already on order. Apart from such difficulties in timing, the discrepancies between actual and anticipated expenditures for all companies combined may also reflect differences in the samples used in deriving aggregate estimates since not all the firms reporting actual outlays also reported anticipated outlays.

There is one systematic quarterly discrepancy between actual and anticipated expenditures which is worthy of note. Actual expenditures as reported for the fourth quarter were regularly higher than anticipated outlays, apparently reflecting the concentration of certain charges to capital accounts in the end-of-year statements.

Reasons for discrepancies

Both annual and quarterly surveys suggest that movements in capital goods prices are an important factor in departures from projected dollar expenditures on plant and equipment. Thus the price rises for capital goods during 1947 and 1950 might have been responsible for as much as half the discrepancies between actual and anticipated expenditures for those years. In 1948 and 1949 the price movements were again in the same direction as, but percentagewise even larger than, the discrepancies between actual and anticipated expenditures. On a quarterly basis, businessmen fairly consistently overestimated their outlays during the few periods in which prices declined and generally underestimated their outlays in other periods. It is quite possible, therefore, that anticipated outlays to a considerable extent reflect a planned physical volume of investment valued at prevailing prices, and hence do not sufficiently take account of price factors.

Chart 1.—Business Expenditures for New Plant and Equipment: Actual and Anticipated [1]



[1] Data exclude expenditures of agricultural business and outlays charged to current account. Anticipated expenditures were reported by business between mid-January and mid-March of the respective year.

[2] Data for 1950 include actual expenditures for the first three quarters and anticipated expenditures for the fourth quarter.

Sources of data: U. S. Department of Commerce, Office of Business Economics, and Securities and Exchange Commission.

There are two other sets of factors, apart from random miscalculations, which may cause actual expenditures to diverge from expectations. First, changes in economic conditions obviously have some effect on investment plans totally aside from their influence on the prices of capital goods. Second, abstracting from economic conditions and assuming that they conform to expectations, there is probably a systematic understatement in anticipated fixed capital outlays reported for any period well in the future, since businessmen generally tend to be conservative in their budget or stated plans and are likely to omit their more tentative projects. Thus the greater understatement of actual expenditures in the second half of the year than in the first half, as indicated by the anticipated quarterly and annual figures reported at the beginning of the year, is presumably due at least in part to the lesser completeness of future programs as compared to near-term budgets.

The following sections compare actual and anticipated expenditures on an individual company basis to obtain information which cannot be derived from the aggregate

figures. The analysis will be confined for the most part to annual data for manufacturing firms since the sample of respondents is largest for this group.

Individual Company Expenditures—Actual Versus Anticipated

The accuracy with which individual firms anticipate their plant and equipment expenditures is of interest from several points of view. First, it is important to determine whether the relatively close agreement between expenditures and anticipations in the aggregate is the result of accurate programing on the part of individual firms or whether it relies heavily on offsets between large positive and negative errors. In the latter case the reliability of the predictions over time will depend on the stability of the forces which bring about a balance between positive and negative discrepancies. Second, an analysis of the individual discrepancies makes it possible to determine whether anticipations are more accurate for certain groups of firms and certain types of investment than for others and this may lead to improvement of extrapolation procedures. Third, any information regarding the firmness of individual companies' investment programs contributes to knowledge of the behavior of the firm and is a tool for the study of investment decisions.

Percentage deviations from anticipated investment

Table 2 and chart 2 show the frequency distribution of percent changes of actual from anticipated expenditures for 941 manufacturing firms which reported both figures for 1949.[3] Here, as elsewhere in this section, similar results have been obtained for 1948 and 1947 but only the 1949 figures are presented. Unless otherwise indicated, expenditures for used as well as new plant and equipment have been included,

Table 2.—Frequency Distribution of Percent Changes in Investment Plans, Manufacturing Firms 1949 [1]

Percent change of actual expenditures from anticipation	Number of firms	Percent
−100 to −80	28	3.0
−79.9 to −60	33	3.5
−59.9 to −40	71	7.6
−39.9 to −20	119	12.6
−19.9 to 0	138	14.7
0 to 19.9	120	12.8
20 to 39.9	103	11.0
40 to 59.9	61	6.5
60 to 79.9	36	3.7
80 to 99.9	27	2.9
100 to 119.9	34	3.6
120 to 139.9	14	1.5
140 to 159.9	15	1.6
160 to 179.9	15	1.6
180 to 199.9	7	.7
200 and over	113	12.0
Total	941	100.0

[1] Includes all reporting firms for which either actual or anticipated expenditures exceeded $10,000. Anticipated expenditures were reported by business between mid-January and mid-March 1949.

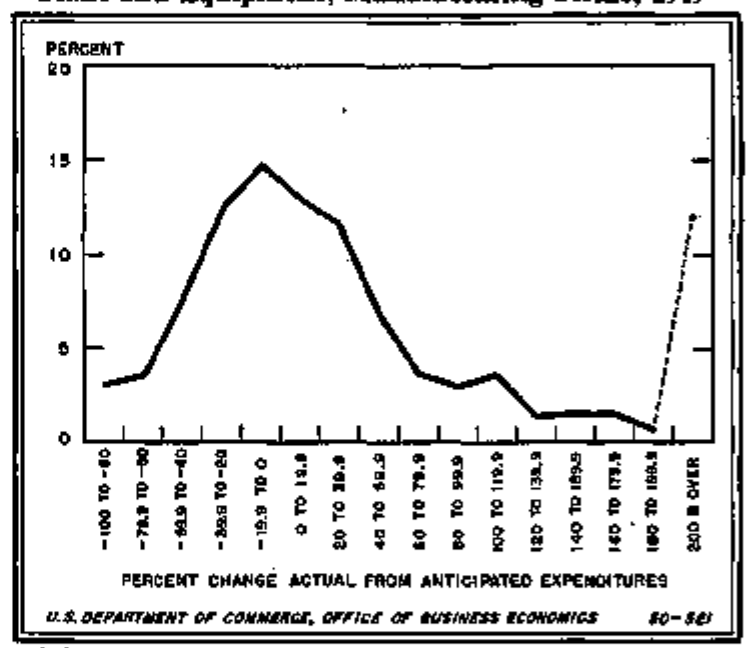
Source: U. S. Department of Commerce, Office of Business Economics, and Securities and Exchange Commission.

although the aggregate figures refer to new only. In 1949 purchases of used capital goods constituted a very small proportion of the total.

A considerable degree of dispersion is indicated by the figures in table 2. Only a little more than one-fourth of the firms came within 20 percent of their anticipations, while over one-fifth spent more than twice and one-tenth spent less than half the amount planned. Thus it appears that the high accuracy of the aggregate projection in 1949 results from offsets between underestimates and overestimates and from the fact (to be discussed later) that large firms and firms projecting major capital outlays performed substantially better than the average. (See tables 3 and 5).[4]

The figures in table 2 do not, however, give a complete picture of the accuracy of individual firms' anticipations. In many cases a large percentage discrepancy between actual and anticipated investment may represent an expenditure which is very minor from the point of view of the firm in question. Thus when the discrepancy is related to the firm's gross fixed assets, it is not ordinarily found to constitute a substantial percentage of this base. For the 513 reporting firms for which information on gross fixed assets was readily available almost half of the discrepancies amounted to less than 2 percent of gross fixed assets, while over 70 percent amounted to less than 4 percent. In only 7 percent of the cases did the discrepancy exceed 10 percent of gross fixed assets.

Chart 2.—Frequency Distribution of Percentage Deviations of Actual From Anticipated Expenditures for Plant and Equipment, Manufacturing Firms, 1949 [1]



[1] Includes all reporting firms for which either anticipated or actual expenditures exceeded $10,000 in 1949. Anticipated expenditures were reported by business between mid-January and mid-March 1949.

Sources of data: U. S. Department of Commerce, Office of Business Economics, and Securities and Exchange Commission.

As in the case of the aggregate figures, projections based on anticipations were found to perform better than projections based on extrapolation of past data.

Tendency to underestimate expenditures

As indicated in table 2, substantially more than half (59 percent) of the firms underestimated their expenditures. Since 1949 was a year of moderate decline in economic activity, the understatement of expenditures by a majority of firms in this year (as well as in previous years) again indicates a systematic tendency in this direction. This will be elaborated in a subsequent section dealing with the reasons

[3] This includes all of the reporting firms for which either actual or anticipated expenditures exceeded $10,000. Where smaller amounts than this were involved, it was felt that the percent change might be a misleading measure of the accuracy of the anticipations.

[4] Where asset data were available, it was found that firms with total assets exceeding $50,000,000 constituted only 6 percent of the firms in the extreme intervals (i. e., with expenditures less than half or more than twice the amount planned) as compared with 21 percent of those in other intervals. Firms with projected expenditures exceeding 15 percent of gross fixed assets constituted 17 percent of the firms in the extreme intervals as compared with 33 percent of those in other intervals.

given by businessmen for departures from their investment programs.

Despite the prevalence of cases in which individual firms exceeded their anticipations, actual investment for all firms was slightly smaller than the aggregate projection. This is primarily due to the fact that firms with negative discrepancies represent a larger proportion of aggregate investment than their number indicates; e. g., the number of negative discrepancies exceeding $1,000,000 is significantly larger than the number of positive discrepancies of this size.[4] It will be seen later that large firms and firms anticipating major expenditures showed no tendency to exceed their investment programs in 1949.[5]

Table 3.—Frequency Distribution of Percent Changes in Investment Plans: Manufacturing Firms, 1949, by Assets Size [1]

Percent change of actual expenditures from anticipation	Total assets					
	Under $10,000,000		$10,000,000 to $50,000,000		Over $50,000,000	
	Number of firms	Percent	Number of firms	Percent	Number of firms	Percent
−100 to −80	1	.6	0		0	
−79.9 to −60	10	6.5	0	2.8	1	1.1
−59.9 to −40	26	11.3	14	6.6	7	7.4
−39.9 to −20	25	11.3	30	14.1	16	17.0
−19.9 to 0	27	12.2	34	16.0	30	31.9
0 to 19.9	21	9.6	37	17.4	15	16.0
20 to 39.9	25	11.3	36	16.9	9	9.6
40 to 59.9	17	7.7	16	8.5	7	7.4
60 to 79.9	9	4.1	7	3.3	2	2.1
80 to 99.9	8	3.6	5	2.3	3	3.2
100 to 119.9	11	5.0	0	2.8	1	1.1
120 to 139.9	4	1.8	2	.9	0	
140 to 159.9	3	1.4	4	1.9	0	
160 to 179.9	4	1.8	0		0	
180 to 199.9	4	1.8	1	.5	1	1.1
200 and over	27	12.2	13	6.1	2	2.1
Total	221	100.0	213	100.0	94	100.0

[1] Includes all reporting firms for which either actual or anticipated expenditures exceeded $10,000 and for which information on total assets at the end of 1948 was readily available. Anticipated expenditures were reported by business between mid-January and mid-March 1949.

Source: U. S. Department of Commerce, Office of Business Economics and Securities and Exchange Commission.

It should also be noted that the tendency for individual firms to understate expenditures was much more pronounced in 1947 than in 1949 or 1948. As indicated in the previous section, this reflects the differential effect in these years of movements in capital goods prices, as well as in other economic variables.

Influence of company characteristics

An attempt was made to determine which characteristics of the individual company appear to affect the accuracy with which investment is anticipated. The most obvious possibilities are size and industry, both of which were tested. Other possibly relevant characteristics involve the mechanics of the firm's decision making—the existence of a formal capital budget for instance. Information of this sort, however, was not available for the reporting companies.

Another basis of classification, which may indicate in some degree the urgency of proposed expenditures, is the condition of the firm's existing stock of capital, as regards both physical repair and obsolescence. Again, direct information on this point was not available, but a rough measure of the relative newness of capital assets was obtained by examining the size of capital outlays in the period 1946–48 relative to the firm's fixed assets.

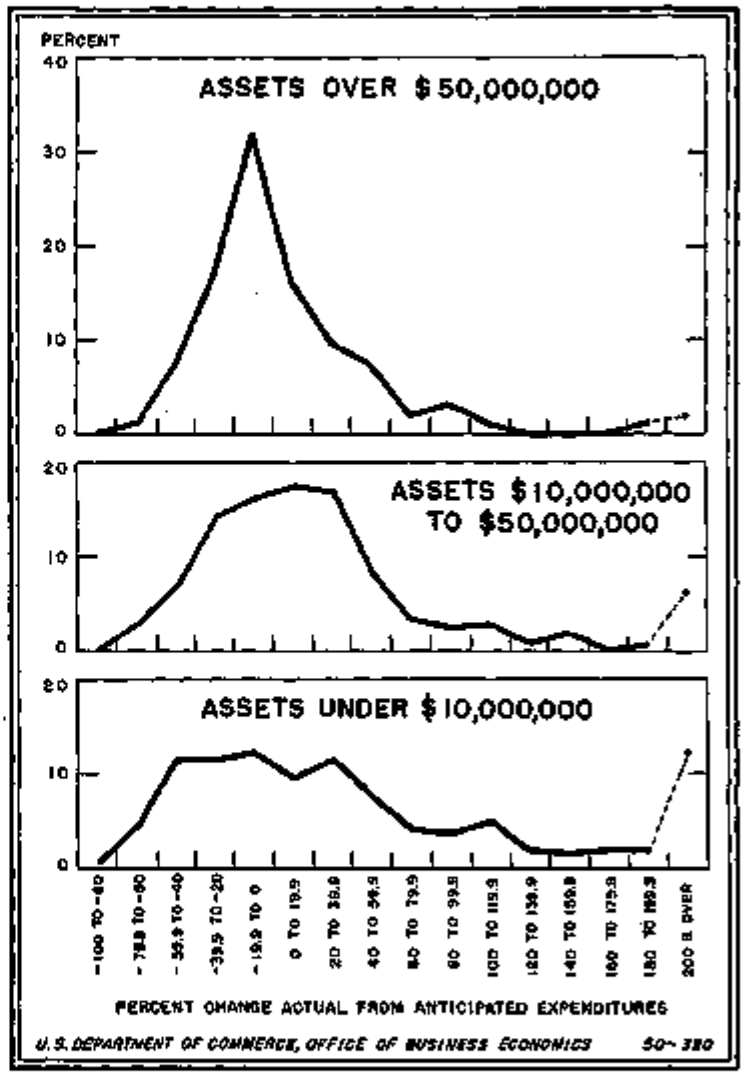
[4] Some difficulty may also arise from the fact mentioned earlier that the total figure for actual investment is based on a slightly different group of firms than for anticipated investment, since some firms report actual expenditures but fail to report anticipations.

[5] Whatever tendency these two groups of firms have toward systematic underestimation of expenditures was somewhat more than offset by cyclical influences in this year.

Breakdown by size

Table 3 and chart 3 give a breakdown by asset size of the percent changes of expenditures from anticipations for those firms for which data on total assets were readily available. Firms with total assets exceeding $50,000,000 were considerably more accurate in their anticipations than the firms with assets between $10,000,000 and $50,000,000; and these in turn were more accurate than the firms with assets less than $10,000,000.

Chart 3.—Frequency Distribution of Percentage Deviations of Actual From Anticipated Expenditures for Plant and Equipment, Manufacturing Firms, 1949, by Assets Size [1]



[1] Includes only those reporting firms for which information on total assets at the end of 1948 was readily available, and for which either anticipated or actual expenditures exceeded $10,000 in 1949. Anticipated expenditures were reported by business between mid-January and mid-March 1949.

Sources of data: U. S. Department of Commerce, Office of Business Economics, and Securities and Exchange Commission.

There are a number of reasons why such a result might be expected. In the first place the expenditure plans of a large firm ordinarily involve a number of separate projects. To the extent that the discrepancies between expenditures and anticipations for these individual projects are random in nature there will already be cancellation of positive against negative discrepancies within the firm.

Second, there are certain expenditures which occur from time to time but which cannot be specifically foreseen in advance—for example, the unexpected breakdown of a piece

of machinery. The large firm will experience a number of such incidents in any given year and will be in a position to make some blanket allowance for them in advance, although unable to predict what the individual items of expenditure will be. The small firm, which experiences few such expenditures in a single year, will frequently not attempt to allow for them in advance, giving rise to a definite bias in the direction of underestimation. In this connection, it might be noted that the only size group which did not show a tendency to underestimate expenditures in 1949 was that with assets over $50,000,000.

Third, a large organization must make its plans further in advance than would be necessary for a smaller firm. The decision-making process is more formalized; a capital budget is more likely to exist. The number of administrative levels which must give approval is larger. These factors contribute not only to the making of decisions well in advance of actual expenditure but also to the inflexibility of plans when made; and the effect is to reduce the likelihood of large discrepancies from anticipations.

Breakdown by industry

A breakdown was also made by industry groups within manufacturing. Seven such groups—namely, food, textiles, paper, chemicals, iron and steel, electrical machinery, and machinery other than electrical—were sufficiently well represented to permit separate analysis.

Of the industries studied, textiles (with 84 firms), paper (with 55 firms), chemicals (with 74 firms), and iron and steel (with 137 firms) gave the best performance in terms of percent discrepancies from anticipations. Only food (95 firms) and machinery other than electrical (121 firms) showed as much or more dispersion than the total distribution.

Chemicals, iron and steel, and machinery other than electrical, in contrast to the general pattern, indicated no tendency to exceed investment plans. In the first two cases this reflects the presence of a high proportion of the very large firms which showed a slight tendency to spend less than anticipated. In the third case, the tendency to exceed investment plans was apparently offset by the relatively sizable decline in sales and profits in 1949. Food and textiles—which were characterized by comparatively small firms and in the case of food by relatively good profit experience—showed a very large predominance of positive discrepancies.

Effect of recent capital outlays

The third company characteristic tested to determine its influence on the accuracy of anticipations was the proportion of the firm's existing plant and equipment which was relatively new. This was estimated at the beginning of 1949 from the size of investment outlays for 1946–48 in relation to 1948 gross fixed assets, though it was realized that gross fixed assets are an imperfect measure of the existing stock of capital. Where the proportion of recent expenditures was small, it was expected that replacement needs would be relatively urgent and that this would tend to diminish the probability of substantial curtailment of projected expenditures.

The firms for which postwar investment amounted to less than 30 percent of gross fixed assets showed a somewhat higher accuracy in 1949 than did firms with larger relative expenditures in 1946–48. More striking is the fact that a much smaller proportion of the former than of the latter group showed negative discrepancies of more than 20 percent.[7]

Influence of type of investment

The accuracy with which expenditure is anticipated may also depend on the nature of the intended investment. Significant differences were found in this respect between investment in plant and in equipment and between expenditures of major and minor proportions (relative to gross fixed assets). It is probable that there are further differences in behavior which depend on whether expansion, cost-cutting, or replacement is primarily involved, but no information was available on which to make such a distinction.

Plant versus equipment

Table 4 shows the percent changes of actual from anticipated expenditures for new plant and new equipment separately.[8] The distribution relating to equipment follows very closely the pattern for plant and equipment combined.

The anticipations as to expenditure for plant are definitely less accurate than for equipment in spite of the fact that construction requires relatively firm commitments for a considerable period in advance of expenditure. Investment in plant is normally a much more discrete process than investment in equipment. For many firms the decision is either to build some particular structure involving a substantial capital outlay, or not to build it, with no half-way measures feasible. Thus, when changes in plans occur, they are likely to be substantial, and it is not surprising that a considerable proportion of cases fall in the extreme intervals of the frequency distribution. Almost a third of the firms spent more than twice as much on plant as anticipated while over a fifth spent less than half the amount planned.

Table 4.—Frequency Distribution of Percent Changes in Investment Plans: Plant Versus Equipment, Manufacturing Firms, 1949[1]

Percent change of actual expenditures from anticipation	New plant		New equipment	
	Number of firms	Percent	Number of firms	Percent
−100 to −80	40	10.9	34	4.6
−79.9 to −60	26	6.1	32	4.2
−59.9 to −40	28	6.6	59	7.8
−39.9 to −20	41	9.6	88	11.6
−19.9 to 0	37	8.7	103	13.6
0 to 19.9	33	7.8	92	12.1
20 to 39.9	29	6.8	73	9.5
40 to 59.9	15	3.5	42	5.5
60 to 79.9	12	2.8	33	4.3
80 to 99.9	12	2.8	35	4.6
100 to 119.9	10	2.4	23	3.0
120 to 139.9	6	1.4	18	2.4
140 to 159.9	9	2.1	10	1.3
160 to 179.9	5	1.2	13	1.7
180 to 199.9	5	1.2	4	.5
200 and over	101	23.8	102	13.4
Total	423	100.0	760	100.0

[1] Included in the analysis of plant expenditures are all reporting firms for which either actual or anticipated expenditures on plant exceeded $10,000. A similar rule was followed with respect to equipment. Anticipated expenditures were reported by business between mid-January and mid-March 1949.

Source: U. S. Department of Commerce, Office of Business Economics, and Securities and Exchange Commission.

Scale of investment

Table 5 shows a breakdown between firms which planned investment on a major scale—exceeding 10 percent of gross fixed assets—and those which anticipated relatively minor expenditures. It appears that anticipations are considerably more accurate in the former case, with 43 percent of the firms spending within 20 percent of anticipations, while only 12 percent spent less than half or more than twice as much as anticipated. When smaller expenditures were planned, 26 percent fell in the range of high accuracy and 26 percent in the extreme intervals.

These results suggest that major investments may be more carefully planned than others, for longer periods in advance. There is, of course, considerable correlation between the

[7] The difference between the two groups is too large to be explained on the basis of size of firm.

[8] The breakdown between plant and equipment is available for new capital goods only. The number of firms is substantially smaller than for plant and equipment combined, since many firms do not report plant and equipment separately. Cases in which both anticipated and actual expenditures were less than $10,000 are again excluded.

asset size of firms and the scale of anticipated investment relative to gross fixed assets; but even within asset-size groups anticipations were found to be more accurate when major expenditures were planned. For firms with assets over $50,000,000, 54 percent of those projecting major expenditures fell within the range of high accuracy, as compared with 40 percent of those planning minor expenditures; and comparable differences occurred in the other two size groups. In all size groups a smaller proportion of firms fell in the extreme intervals when major rather than minor expenditures were projected; and for all but the largest firms the difference was substantial.

Firms projecting minor expenditures showed a systematic tendency toward investing more than was planned, while firms anticipating major capital outlays showed little evidence of such a tendency in 1949. The same pattern held true within asset-size groups for small and medium-sized firms, though large firms showed no tendency to exceed projected expenditures even when these were small relative to existing assets.

Table 5.—Frequency Distribution of Percent Changes in Investment Plans, Classified by Ratio of Anticipated Expenditures to Gross Fixed Assets: Manufacturing Firms 1949 [1]

Percent change of actual expenditures from anticipation	Anticipated expenditure relative to gross fixed assets			
	Greater than 10 percent		Less than 10 percent	
	Number of firms	Percent	Number of firms	Percent
−100 to −80	0		0	
−79.9 to −60	4	2.6	12	3.3
−59.9 to −40	16	10.5	28	7.8
−39.9 to −20	24	15.7	48	13.6
−19.9 to 0	34	22.2	65	18.3
0 to 19.9	32	20.9	40	11.1
20 to 39.9	20	13.1	49	13.6
40 to 59.9	9	5.9	32	8.9
60 to 79.9	3	2.0	15	4.2
80 to 99.9	2	1.3	14	3.9
100 to 119.9	4	2.6	13	3.6
120 to 139.9	1	.7	5	1.4
140 to 159.9	0		7	1.9
160 to 179.9	1	.7	2	.6
180 to 199.9	1	.7	5	1.4
200 and over	2	1.3	38	10.6
Total	153	100.0	360	100.0

[1] Includes all reporting firms for which either actual or anticipated expenditures exceeded $10,000 and for which assets data at the end of 1948 were readily available. Anticipated expenditures were reported by business between mid-January and mid-March 1949.

Source: U. S. Department of Commerce, Office of Business Economics and Securities and Exchange Commission.

A final test was made to determine whether the same firms tend to anticipate accurately in successive years. Apart from the effects of size and other considerations already noted, there was no evidence of such a tendency.

Reasons for Changes in Investment Plans

As previously mentioned, a special follow-up questionnaire was sent to a sample of companies early this year asking them to indicate the reasons for differences between actual and anticipated expenditures in 1949. The questionnaire was sent to most survey firms whose actual outlays on plant and equipment during 1949 differed by more than 25 percent from the expenditures anticipated at the beginning of the year.[9] Replies were received from 368 or 84 percent of the 440 companies contacted. Of these responses, the 305 in manufacturing are analyzed below.

Check list

The companies were given a check list of the more important conditions which might have differed from expectations and were asked to designate the principal factor and other major factors responsible for the discrepancy in expenditures. The list included changes in the sales outlook, current expenses, net earnings, working capital requirements, plant and equipment supply situation, plant and equipment costs (viz, prices paid), availability and cost of debt financing, availability and cost of equity capital, and other (technology, competitive conditions, unfilled orders, etc.). It was realized that not all of these factors were independent in their influence on investment decisions—e. g., changes in the sales outlook or in expenses usually involve changes in the earnings outlook—but it was desired to determine the relative emphasis placed on these factors by businessmen themselves.

In addition, the respondents were requested to indicate the reason for the difference between actual and anticipated outlays if this was not due to a divergence between actual conditions and expectations with respect to the factors enumerated in the check list. They were also asked to submit any other remarks which might help to explain the discrepancy in expenditures.

The explanatory factors mentioned in the responses have been classified into 15 categories. In addition to the eight specific factors in the check list, seven more were included to cover the supplementary comments. As will be seen from the following discussion, there may be different influences affecting plant and equipment expenditures even within the categories used. In some instances it is possible to segregate these influences on the basis of written comments or other supplementary information.

The check list requires little in the way of clarification. The "sales outlook" category has been adjusted by the removal for separate consideration of cases in which the change in sales outlook is associated with a change in competitive conditions and cases in which a new product or a change in product mix is involved.

The "current expenses" category covers two situations. In the first, the effect is one of encouraging or discouraging the substitution of capital for labor, so that current expenses and plant and equipment expenditures might be expected to move in the same direction relative to anticipations. In the second situation, the change in current expenses is simply the reason for a change in earnings and has the same impact as a change in earnings arising from any other source. This would lead to a change in plant and equipment expenditures in the opposite direction from the change in current expenses. The second pattern was the usual one and was characteristic of the cases where earnings or sales was checked as the principal factor and current expenses as a major factor.

The category "plant and equipment supply situation" includes cases in which postwar shortages of capital goods eased more rapidly than anticipated, as well as cases of purely routine delays and speed-ups in the delivery of capital goods on order. The category "plant and equipment costs" covers cases in which the physical volume of investment is not particularly affected but prices and hence dollar expenditures are different from those anticipated, and cases in which purchases are induced or deferred because of price changes. The two types of cases under this category operate differently on plant and equipment expenditures but can generally be distinguished by the direction of the discrepancy between actual and anticipated prices of capital goods; the first type—where physical quantities are not particularly affected—was somewhat more common during the year covered.[10]

Other explanatory factors

The seven explanatory factors which were added to those contained in the check list are as follows: Change in competitive conditions; new product or change in product mix;

[9] This questionnaire was not sent to all of the firms in this group since it was necessary to obtain other information from them and it was not desired to burden any firm unduly. Moreover, if actual expenditures were under $5,000, a questionnaire was sent only if the discrepancy was in excess of $1,000.

[10] This type of case was definitely more important than the other for new plant and equipment. However, as an offset, there were a number of cases in which unanticipated purchases of used plant and equipment were made because bargains became available.

change in technology; timing problems; routine under- or over-estimates; and miscellaneous."[1] In all cases the changes referred to are changes from expectations.

The category "change in competitive conditions" contains all cases where this factor is mentioned, even though sales outlook may be the factor checked. When competitive conditions are mentioned, the pattern of behavior is a fall in sales below anticipations, accompanied by a rise in plant and equipment expenditures. This is in contrast with the parallel movement of sales and capital goods expenditures which predominates when sales are checked and competitive conditions are not mentioned.

"New product or change in product mix" covers, in about equal number, cases in which a new product is introduced or the demand for a new product exceeds expectations, and cases where, in response to shifts in demand the production of certain products is expanded at the expense of others. However, when the unanticipated expenditure results from style changes or minor product improvements, the classification "routine under-estimate" is used.

"Changes in the availability of labor or raw materials" during 1949 applied mainly to strikes. In a couple of cases, material shortages were involved.

"Changes in technology" covers the cases where developments in production techniques appear to have governed the decision to spend more or less for plant and equipment than was anticipated. Process changes and reevaluation from a technological point of view of proposed equipment purchases are included here.

Under "timing" are included situations in which a proposed investment decision takes more (or in a few cases less) time to consummate than was anticipated. The time lag generally is that between the original investment decision and the placing of the order or contract. No change of decision or intent by the management to postpone the project is involved. Delays or speed-ups which arise from the supply side—from supply shortages or the acceleration of deliveries of capital goods already on order—are of course included under "plant and equipment supply situation" rather than here.

"Routine under- or over-estimate" is intended to apply where the discrepancy results from a number of small expenditure items rather than the initiation or cancellation of any major projects. The typical pattern here is that the firm estimates a certain lump sum, not for expenditures specifically in mind at the time but to cover replacement and miscellaneous other needs which will arise during the year in the ordinary course of operations. This estimate may be either too small or too large to take care of the needs which actually arise.

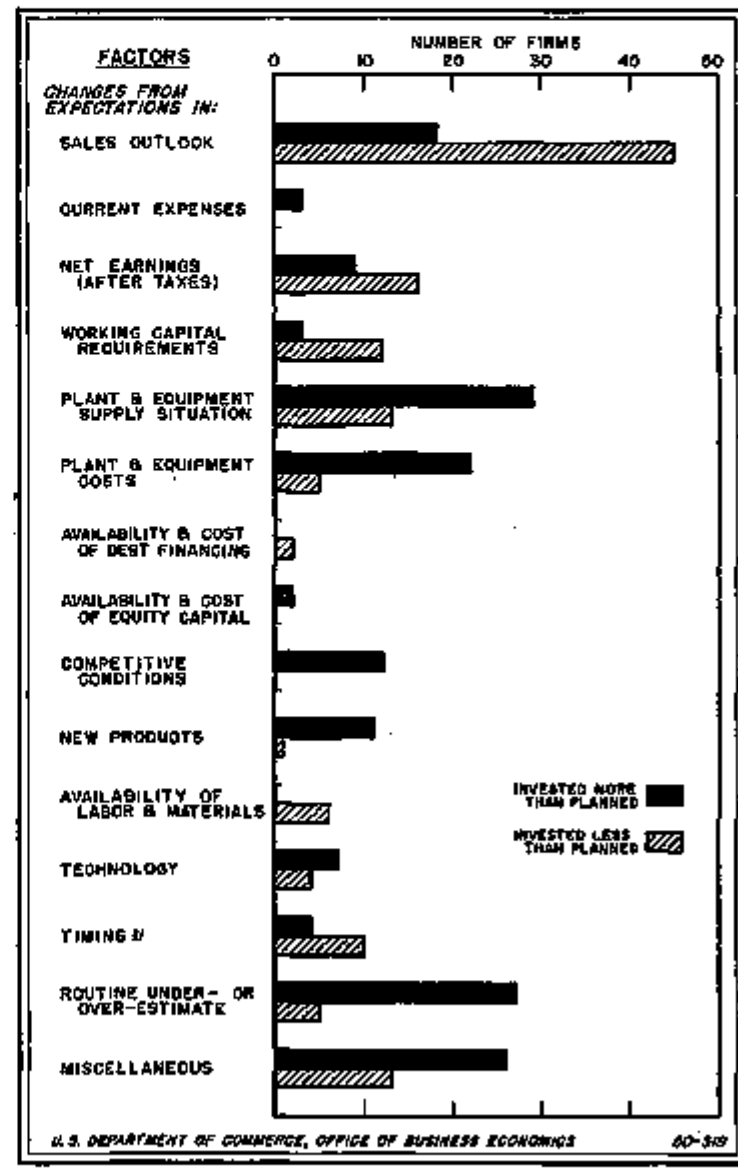
The miscellaneous category includes a number of subgroups. The largest of these (the principal factor in 15 cases and a major factor in 5 cases) contains the firms which simply state that certain projects were initiated or deferred or canceled without any clear indication as to why this decision was made, except for an apparent tendency to exclude from reported investment programs items whose acquisition is uncertain. The projects here are too large and too specific for the concept of a routine under- or over-estimate to be appropriate. A second subgroup (six cases, all principal) consists of instances in which the discrepancy is purely a matter of accounting procedure—a decision as to what items of expenditure should be capitalized and when. In other subgroups the discrepancy is related to the sale or dissolution of the business (two cases), the replacement of a major fire loss (two cases), the decision to buy rather than lease the needed capital good (four cases), and clerical errors in the reporting of actual or anticipated expenditures (six cases, including five principal and one major). A final subgroup contains one-of-a-kind cases not otherwise classified (five cases).

[1] Changes in competitive conditions and in technology were the only two of these factors which were suggested in the questionnaire as possible "other" conditions which might differ from expectations.

Importance of different factors

Chart 4 and table 6 indicate the number of firms giving designated reasons for discrepancies between actual and anticipated expenditures in 1949, segregating firms which exceeded investment plans by at least 25 percent from those which curtailed plans by this amount. The table shows the frequency with which each factor was indicated as being the principal influence, and also the frequency with which it was mentioned as a major influence. For principal factors, the table shows separately the firms which gave one reason only

Chart 4.—Frequency Distribution of Explanatory Factors for Changes in Investment Plans, Manufacturing Firms, 1949 [1]



[1] Survey included only those firms whose actual plant and equipment expenditures in 1949 differed by more than 25 percent from anticipated outlays reported by business between mid-January and mid-March 1949. Factors include only those indicated as "principal" by respondents.

[2] Time lag in placing of order or contract.

Sources of data: U. S. Department of Commerce, Office of Business Economics, and Securities and Exchange Commission.

and those which indicated major influences in addition to the principal factor.[12]

A change in the sales outlook was by far the most commonly mentioned as the reason for a decrease in expenditures below the level anticipated at the beginning of the year. Unlike the other reasons given for discrepancies between actual and anticipated expenditures, information does exist on the level of actual and anticipated sales for a high proportion of the firms in the survey so that a quantitative comparison can be made between the discrepancies in expenditures and the extent to which conditions differed from expectations with respect to sales.

For the firms mentioning a change in sales outlook as the principal reason for discrepancies between actual and anticipated expenditures, there was a strong positive correlation between changes in expenditures and in sales; i. e., the larger the discrepancy in sales relative to anticipations the larger the corresponding discrepancy in expenditures. In contrast, there was no such correlation between discrepancies in expenditures and sales for the firms specifying other reasons for a divergence between actual and anticipated outlays. For the firms not sent the special follow-up questionnaire, there was only a slight positive correlation between discrepancies in expenditures and sales.

A second factor of some importance in reducing planned outlays was a change in the earnings outlook. Together changes in the sales and earnings outlook, which are obviously closely related, accounted for nearly half of the cases where actual expenditures in 1949 were lower than those anticipated.[13] These two factors were also given as reasons for increasing expenditures but in a much smaller proportion of the cases. Of the other factors resulting in revisions in planned outlays, only three—working capital requirements, timing, and availability of labor and materials—were clearly more important on the down than on the up side.

The most significant factors tending to increase planned outlays were changes in the plant and equipment supply situation, in plant and equipment costs, competitive conditions, new products, routine underestimates, and miscellaneous influences resulting in the initiation of substantial new projects. These factors were mentioned as the principal motivating forces by 73 percent of the firms with expenditures higher than planned but only by 28 percent of the firms with lower expenditures.

It is interesting to note that changes in the availability of debt and equity financing were quite unimportant in altering planned outlays on plant and equipment. In a year when debt financing apparently became somewhat more difficult to obtain, only a few firms substantially decreased their capital expenditures as a result of this development. Similarly, though stock prices rose considerably during 1949 and equity financing was more attractive to business concerns, very few firms were thereby induced to step up their expenditure programs.

The other two factors indicated in the table—changes in current expenses and in technology—also had only a small influence in revisions of planned outlays. Only a few firms were induced to substitute capital for labor to a significantly greater extent than planned at the beginning of the year. A somewhat higher proportion of firms increased their plant and equipment expenditures as a result of technological developments, but these were offset in large part by firms which decreased their planned outlays for the same reason.

Cyclical versus non-cyclical influences

The period covered by these questionnaire replies obviously affects both the relative frequency with which a specific factor is mentioned, and for many of the factors the relative frequency of increases as compared with decreases in expenditures. The importance of a number of these factors and the direction of their effect on expenditures will vary widely in different stages of the business cycle.

The effect of changes in the sales and earnings outlook

[12] It may be noted that though there are more increases than decreases in the table, the preponderance of increases is not quite so marked for these firms with substantial discrepancies as for the entire sample of firms reporting in the Office of Business Economics—Securities and Exchange Commission survey (see table 2). The apparent explanation for this difference is that small routine discrepancies are more likely than major discrepancies to be associated with increases as compared with decreases in expenditures.

[13] When more than one factor was mentioned by the same firm, a change in the sales outlook was more frequently associated with a change in the earnings outlook than with any other factor. Both were in a number of instances, either separately or jointly, mentioned together with a change in working capital requirements. It may be noted that changes in the sales and earnings outlook accounted for a higher proportion of downward revisions in equipment than in plant.

Table 6.—Frequency Distribution of Explanatory Factors for Changes in Investment Plans: 305 Manufacturing Firms, 1949 [1]

Factor	Distribution of firms designating factor as: Principal reason for change: All firms: Increased outlays [2] (Number)	All firms: Decreased outlays [2] (Number)	All firms: Increased outlays [2] (Percent)	All firms: Decreased outlays [2] (Percent)	Firms mentioning principal factor only: Increased outlays [2] (Number)	Firms mentioning principal factor only: Decreased outlays [2] (Number)	Firms mentioning both principal and major factor: Increased outlays [2] (Number)	Firms mentioning both principal and major factor: Decreased outlays [2] (Number)	Major reason for change: Increased outlays [2] (Number)	Major reason for change: Decreased outlays [2] (Number)
Changes from expectations in:										
Sales outlook	18	45	10.4	34.1	6	22	12	23	8	15
Current expenses	3	0	1.7		2	0	1	0	1	11
Net earnings (after taxes)	8	16	5.2	12.1	2	2	7	14	5	16
Working capital requirements	3	12	1.7	9.1	1	4	2	8	3	12
Plant and equipment supply situation	29	13	16.8	9.8	21	7	8	6	0	2
Plant and equipment costs	22	5	12.7	3.8	13	4	9	1	10	11
Availability and cost of debt financing	0	2		1.5	0	1	0	1	0	1
Availability and cost of equity capital	2	0	1.2		1	0	1	0	2	0
Competitive conditions	12	0	6.9		9	0	3	0	4	0
New products	11	1	6.4	.8	7	1	4	0	3	0
Availability of labor and materials	0	6		4.5	0	5	0	1	0	1
Technology	7	4	4.0	3.0	5	3	2	1	2	2
Timing [3]	4	10	2.3	7.6	2	8	2	2	3	6
Routine under- or over-estimate	27	5	15.6	3.8	23	4	4	1	8	5
Miscellaneous [4]	28	13	16.0	9.8	24	11	4	2	6	1
All factors	173	132	100.0	100.0	120	72	53	60	63	84

[1] Survey included only those firms whose actual plant and equipment expenditures in 1949 differed by more than 25 percent from anticipated outlays reported by business between mid-January and mid-March 1949.

[2] Increased (decreased) outlays refer to 1949 expenditures higher (lower) than anticipated by the firm at the beginning of 1949.

[3] Time lag in placing of order or contract.

[4] See text for breakdown of these factors.

Source: U. S. Department of Commerce, Office of Business Economics, and Securities and Exchange Commission.

would be expected to be completely different in a period of strong inflationary conditions or at other points of the business cycle than in the very moderate downturn in 1949. Thus whereas in a downturn, or at least in its initial stages, the apparent effect of changes in these factors for most firms is to lower planned outlays, the reverse effect is likely in a recovery.

It is more difficult to tell whether the other significant factors resulting in downward revisions in planned outlays—working capital requirements, timing, and availability of labor and material—are strongly influenced by cyclical movements. Thus to the extent that the depressing influence of changes in working capital requirements in 1949 on plant and equipment expenditures was a reflection of smaller sources of funds from internal operations than had been anticipated without a corresponding reduction in working capital requirements, the effect might be assumed to be cyclical and related to sales and earnings.[14] However, to the extent it reflects no change in the availability of funds but larger working capital requirements than had been anticipated, it is not easy to determine the cyclical impact.

Changes in the availability of labor and materials, which tended to reduce capital expenditures in 1949, presumably have their greatest effect in a boom period and much less effect in a depression. Only timing difficulties, of the important factors depressing investment, seem to be largely noncyclical in character.

Similarly, a number of the factors resulting in upward revisions in programmed expenditures during 1949 were affected to some extent by cyclical influences. The plant and equipment supply situation is one such factor, but as a result of the special wartime and postwar developments the easing of supply conditions for capital goods probably had a more important impact on expenditures in 1949 than might normally be expected from purely cyclical influences.

Plant and equipment costs also reflect cyclical influences but again it is difficult to infer from the 1949 experience any normal cyclical behavior. It is easy enough to describe the behavior of the two component parts, the first composed of cases in which the anticipated purchase is made but at different cost, the second of cases in which a purchase is induced or deferred because of change in costs. However, each of these operates differently on plant and equipment expenditures and it is not possible to determine the relative importance of these two types of cases in various stages of the cycle. In 1949, the cases in which the physical quantities of purchases were not particularly affected (but only the dollar expenditures) were somewhat more important than the other cases in stimulating upward revisions in programmed expenditures, particularly for new plant and equipment. Apparently, in spite of the slight decline in average costs during the year, a sizable number of companies anticipated lower costs than actually prevailed.[15]

Neither the plant and equipment supply situation nor plant and equipment costs appears to be as strongly dependent on cyclical considerations as the more important factors responsible in 1949 for downward revisions in programed expenditures—viz, changes in the sales and earnings outlook. Moreover, the other key factors on the up side—competitive conditions, new products, routine underestimates and miscellaneous influences resulting in the initiation of substantial new projects—appear to be even less dependent on cyclical influences. This is especially true for the last two of these categories.

The foregoing discussion suggests that while a sizable proportion of the changes in planned outlays on plant and equipment is attributable to factors whose impact is cyclically determined, there are other important factors which are largely independent of the level of business activity. It is not possible without similar data for a number of periods to appraise the relative importance of the different factors in various stages of the business cycle.

However, in addition to the cyclical influences, there is evidence once again of a systematic tendency on the part of businessmen to underestimate their plant and equipment expenditures in their programs for the following year. Among the factors responsible for this systematic understatement are the omission of many small items of capital outlays and a tendency to exclude items whose acquisition is uncertain. These factors help to explain the earlier finding that nearly three-fifths of all firms included in the joint Department of Commerce and Securities and Exchange Commission survey underestimated their plant and equipment expenditures in 1949, even though about the same proportion overestimated their sales.

Explanatory factors by size of firm

Though the data are rather scanty, table 7 suggests that the relative importance of several factors for explaining discrepancies between actual and anticipated expenditures varies by size of firm. The table presents for 3 different size groups of firms a distribution of the principal factors which resulted in higher outlays than anticipated and of those which resulted in lower outlays.[16]

The table indicates that in 1949 changes in the plant and equipment supply situation and in competitive conditions were relatively much more important in raising expenditures of the smallest firms than for the largest firms. Only the smallest firms mentioned changes in the earnings outlook as a significant factor in reducing planned outlays. The few firms in the total sample which gave changes in the availability and cost of debt and equity financing as the primary factor in explaining discrepancies between actual and anticipated outlays were all relatively small; each had assets less than one million dollars in amount. There were also minor differences in the apparent effect of technology and new products among the three size groups.

However, possibly the most interesting difference is the much greater importance of routine and miscellaneous miscalculations for medium-size and small firms as compared to the large firms. For the latter, there is no indication of any systematic tendency to underestimate plant and equipment expenditures. Of the other factors, changes in the sales outlook, in working capital requirements, and in plant and equipment costs, had about equal impact on expenditures in all of the size groups.

Explanatory factors by size of discrepancy

As might be expected, a distribution of the absolute size of discrepancies in plant and equipment expenditures associated with various explanatory factors shows about the same picture as the distribution by size of firm. For the large absolute discrepancies, routine under- and over-estimates are quite unimportant on both sides, and miscellaneous miscalculations, though somewhat more important, cancel out in their net impact on plant and equipment expenditures.[17]

[14] It might be noted that where working capital requirements were mentioned as the principal factor inducing a reduction in plant and equipment expenditures, actual sales during 1949 were lower than those anticipated at the beginning of the year in half the cases and higher in the other half.

[15] The aggregate expenditure figures and data on costs suggest that this factor may have been much more significant in 1947 and probably also, to a lesser extent, in 1948 and 1950.

[16] The firms are classified by sales size since this was available in virtually every case whereas assets size was available only in a much smaller proportion of the cases. However, a distribution by assets size seems to show approximately the same size differences as those depicted in table 7. The data are inadequate for an industry breakdown.

[17] The situation is different, however, for the large relative discrepancies—i. e., the ratios of absolute discrepancies to anticipated investment—which represent for the most part small and medium-size firms and for which the distribution of explanatory factors is very close to that for all firms.

Table 7.—Frequency Distribution of Principal Explanatory Factors for Changes in Investment Plans: 305 Manufacturing Firms, 1949, by Sales-Size [1]

Item	Under $2,000,000		$2,000,000 to $20,000,000		$20,000,000 and over		Under $2,000,000		$2,000,000 to $20,000,000		$20,000,000 and over	
	Increased outlays [2]	Decreased outlays [2]	Increased outlays [2]	Decreased outlays [2]	Increased outlays [2]	Decreased outlays [2]	Increased outlays [2]	Decreased outlays [2]	Increased outlays [2]	Decreased outlays [2]	Increased outlays [2]	Decreased outlays [2]
	Number of firms						Percent					
Changes from expectations in:												
Sales outlook	8	16	9	18	3	11	9.0	37.2	11.4	32.7	11.1	32.4
Current expenses	2	0	1	0	0	0	3.0		1.3			
Net earnings (after taxes)	1	0	4	3	4	4	1.5	20.9	5.1	5.5	14.8	11.8
Working capital requirements	1	4	1	4	1	4	1.5	9.3	1.3	7.3	3.7	11.8
Plant and equipment supply situation	13	0	14	0	3	4	17.9		17.7	16.4	11.1	11.8
Plant and equipment costs	0	2	7	1	0	2	13.4	4.7	8.8	1.8	22.2	5.9
Availability and cost of debt financing	0	1	0	1	0	0		2.3		1.8		
Availability and cost of equity capital	0	0	2	0	0	0			2.5			
Competitive conditions	8	0	3	0	1	0	11.0		3.8		2.7	
New products	4	1	0	0	1	0	6.0	2.3	7.6		2.7	
Availability of labor and materials	0	2	0	1	0	2		4.7		1.8		2.3
Technology	1	2	4	2	2	0	1.5	4.7	5.1	3.6	7.4	
Timing [3]	1	1	2	6	1	1	1.5	9.3	2.5	14.5	3.7	2.9
Routine under- or over-estimate	10	2	15	2	2	1	14.9	4.7	19.0	3.6	7.4	2.9
Miscellaneous	19	3	11	6	3	4	17.0	7.0	13.0	10.9	14.1	11.8
Total	67	43	79	55	27	34	100.0	100.0	100.0	100.0	100.0	100.0

[1] Survey included only those firms whose actual plant and equipment expenditures in 1949 differed by more than 25 percent from anticipated outlays reported by business between mid-January and mid-March 1949. Factors include only those indicated as "principal" by respondents. Sales-size is based on 1948 sales.

[2] Increased (decreased) outlays refer to 1949 expenditures higher (lower) than planned by the firm at the beginning of 1949.

[3] Time lag in placing of order or contract.

Source: U. S. Department of Commerce, Office of Business Economics, and Securities and Exchange Commission.

Nonmanufacturing firms

Though follow-up questionnaires to determine the reasons for differences between actual and anticipated expenditures in 1949 were sent to nonmanufacturing as well as manufacturing firms whose actual outlays were more than 25 percent higher or lower than anticipated, it was only for the railroad group that the sample response was sufficient to justify separate treatment. For this group, under- and overstatement of outlays were equally common.

Changes in the sales and earnings outlook, in working capital requirements, and timing difficulties tended to reduce planned investment for railroads as they did for manufacturing firms. However, changes in the sales outlook were much less important for the railroads. On the other hand, routine under- or over-estimates were much more important on the up side, accounting for well over half of the revisions in planned outlays, but only a negligible proportion of decreases. Most other factors were relatively insignificant.

Statistical Relationships Between Discrepancies and Explanatory Variables

Four major groups of factors were indicated in the follow-up responses as reasons for deviations from investment plans: Changes in the sales and profitability picture; changes in the availability of funds either from internal or from external sources; changes arising from a variety of reasons not connected with the firm's economic position—e. g., technological considerations, misjudgments as to timing, or necessity for unexpected replacement; and changes arising from the supply side, in the cost and availability of capital goods. The influence of factors in the first 2 groups may be investigated further by comparing the observed discrepancies of actual from anticipated expenditures with the movements in such variables as sales, profit rates, and various measures of liquidity and availability of funds.

It should be pointed out that the analysis of deviations from investment plans in a particular year is a somewhat different problem from the analysis of investment decisions themselves. For example, the timing of orders and deliveries and the availability of capital goods are factors which may have considerable effect in explaining differences between actual and anticipated expenditures in a given year but no substantial impact on the total of investment over somewhat longer periods. Conversely, the record of sales and profit experience previous to the formulation of the investment program will be an important determinant of the investment decision, but subsequent changes in these variables may not contribute as greatly to the explanation of deviations from the original plan.

Effect of changes in sales and earnings

The evidence supplied by the follow-up responses indicates that changes in sales and earnings subsequent to the formation of the investment plan influence the extent to which the plan is realized. However, the correlation between percent deviations from anticipated expenditures in 1949 and percent changes in sales either from expectations or from sales in the previous year was found to be quite low.[15] The same result holds in 1948 and in 1947.

A rather large proportion of firms shows an increase in capital outlays above anticipations in spite of a fairly substantial decline in sales. This recalls the pattern of behavior found in the follow-up responses in those cases where a decline in sales was associated with a change in competitive conditions. It appears that when the competitive situation is an important factor, the investment response to a decline in sales is opposite in direction to that which ordinarily occurs. The fact that a negative relationship between these variables is superimposed upon the predominantly positive one is partly responsible for the unsatisfactory nature of the results obtained.

Movements in sales, in addition to influencing profit expectations, may reflect changes in the pressure on productive capacity. An attempt was made, however, to find a

[15] Discrepancies between actual and anticipated investment were measured relative to gross fixed assets, as well as to anticipations, in studying the influence of sales movements and other variables which will be considered later. However, correlations were not substantially improved when discrepancies were measured in terms of gross fixed assets.

variable which would be more adequate than sales for this purpose. The variable used was the ratio of unfilled orders to sales, but no significant correlation was found when the changes in this ratio were compared with the percent deviations from investment plans.

Movements in earnings, also, were found to contribute little toward the explanation of discrepancies between actual and anticipated expenditures. The two income variables tested were the change in profit rates from the previous year and the difference between the actual profit rate and an estimate of the expected rate, obtained by multiplying sales anticipations and the ratio of income to sales in the previous year. The correlation in both cases was small.

In evaluating these results it should be recalled that the period studied was unusual in the existence of a large backlog of demand for plant and equipment, and this may have diminished the influence of changes in sales and earnings upon investment. On the other hand, changes in earnings cannot be expected to exert a direct influence on the realization of investment plans except insofar as the current profit movements influence fairly long-run profit expectations.[19] Even when the investment under consideration represents expansion, the current fluctuations in sales and profits may not have a predominant influence on the expected rate of return. When cost-cutting or the replacement of obsolescent machinery is involved, the influence will be even less, since in this case the expected rate of return is likely to be quite unrelated to over-all profit rates on existing investment.

Effect of liquidity

A number of variables relating to liquidity were also tested to determine their effect on the discrepancies between actual and anticipated investment. It was believed that unexpected decreases in the liquid funds internally available might contribute to the curtailment of planned investment, since many firms either do not find external financing available or prefer not to make use of it. To a lesser extent unexpected increases in liquid assets might lead to an expansion of investment plans, especially in cases where a desirable expenditure is being postponed because of a shortage of working capital.

Changes in the ordinary liquidity ratios did not yield satisfactory results because unanticipated investment in itself operates to make the year-end position less liquid than otherwise.[20] The resulting tendency toward a negative correlation between discrepancies from planned investment and movements in liquidity ratios apparently outweighed any influence which increases (or decreases) in liquidity might exercise toward encouraging (or discouraging) investment expenditures. Only slightly better results were secured by utilizing an estimate of the unexpected change in liquid funds available from internal operations. This estimate was obtained by adjusting the difference between actual profits and the previously discussed estimate of expected profits for changes in liquidity requirements associated with a level of sales and profits different from expectations. Results were not improved when profits were held constant.

Quite apart from any changes in liquidity, the level of surplus liquid assets—not required for current operations—might influence the extent to which it was possible to carry out additional investment expenditures that become desirable during the year. The degree of excess liquidity in 1949 was measured by comparing the ratio of liquid assets to sales with an average of the corresponding ratios for 1948 and 1941—2 years in which business enterprises as a whole held rather little in the way of surplus liquid assets. The correlation between this measure of surplus liquidity and the discrepancy of actual from anticipated investment was small for the reporting sample as a whole, but larger for those firms which experienced sizable increases in sales as compared with anticipations. Such firms presumably had a strong motive for exceeding their projected investment and the existence of excess liquidity apparently had an appreciable effect in encouraging investment under these circumstances.

[19] There may also be an indirect effect through resulting changes in liquidity.

[20] Among the liquidity variables tested without significant results were changes in the following ratios: liquid assets to sales, liquid assets to current liabilities, current assets to current liabilities, long-term debt to net worth, long-term debt to common plus preferred stock, interest charges to net income before interest and taxes, and net current assets to long-term debt. Changes in the cost of equity capital, as measured by the earnings/price and dividends/price ratios, were also tested.

New or Revised STATISTICAL SERIES

Employees in Trade and Service, Unadjusted Data: Revisions for Page S–11 [1]

(Thousands of employees)

Month	Trade								Service							
	1939	1940	1941	1942	1943	1944	1945	1946	1939	1940	1941	1942	1943	1944	1945	1946
January	5,242	6,608	6,965	7,355	7,073	7,135	7,306	6,035	3,203	3,320	3,522	3,748	3,529	3,575	3,870	4,438
February	5,328	6,500	6,884	7,296	7,021	7,101	7,270	6,101	3,204	3,334	3,539	3,731	3,538	3,573	3,872	4,484
March	5,403	6,797	7,053	7,323	7,071	7,146	7,371	6,251	3,241	3,384	3,594	3,779	3,570	3,610	3,890	4,537
April	5,452	6,745	7,326	7,311	7,174	7,174	7,374	6,420	3,285	3,441	3,668	3,833	3,600	3,623	3,919	4,581
May	5,526	6,833	7,280	7,302	7,161	7,151	7,380	6,499	3,352	3,497	3,728	3,880	3,643	3,655	3,961	4,657
June	5,571	6,900	7,402	7,249	7,157	7,162	7,318	6,468	3,385	3,527	3,750	3,924	3,680	4,008	4,027	4,643
July	5,608	6,812	7,390	7,145	7,093	7,141	7,313	6,412	3,385	3,527	3,779	3,928	3,709	3,990	4,044	4,642
August	5,614	6,843	7,451	7,139	7,030	7,118	7,310	6,562	3,398	3,560	3,803	3,930	3,700	3,976	4,004	4,649
September	5,693	7,033	7,568	7,219	7,108	7,208	7,387	6,731	3,417	3,571	3,810	3,947	3,670	3,984	4,039	4,650
October	5,899	7,130	7,690	7,371	7,204	7,275	7,701	6,905	3,346	3,542	3,772	3,899	3,637	3,930	4,220	4,682
November	6,383	7,241	7,748	7,461	7,442	7,514	8,033	6,159	3,317	3,542	3,780	3,852	3,610	3,909	4,312	4,698
December	7,293	7,729	8,135	7,599	7,720	7,950	8,441	6,911	3,320	3,507	3,740	3,890	3,603	3,899	4,338	4,692
Monthly average	5,812	6,960	7,410	7,333	7,189	7,260	7,622	6,502	3,321	3,477	3,705	3,867	3,610	3,834	4,056	4,621

[1] Compiled by the *U. S. Department of Labor, Bureau of Labor Statistics*. Revisions shown above reflect the shift of the automotive-repair industry from the trade division to the service division. The figures for September–December 1948 supersede those shown on p. 24 of the November 1949 SURVEY; data beginning 1947 in that table and in subsequent issues of the SURVEY are comparable with the current series, having been revised for the above-mentioned transfer.